

## BRAZIL'S LONG FIGHT AGAINST EPIDEMIC DISEASE, 1849-1917, WITH SPECIAL EMPHASIS ON YELLOW FEVER\*

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“ONE comes to the tropical or semitropical countries for the first time with an idea that they are hotbeds of all disease and veritable pest holes.”<sup>1</sup> This statement was made by Dr. W.J.S. Stewart, a United States naval surgeon stationed in Rio de Janeiro in 1904. At the time, few residents of temperate zones would have argued the point with Dr. Stewart and many would have singled out Brazil as one of the world's worst offenders in matters of public health. There is much historical evidence to support such a view; so much so, in fact, that one is surprised to discover that until about 1850 Brazil was widely known for her remarkably salubrious climate. The following statement, written by an English naval physician in 1830, is rather typical of opinions expressed before 1850 on the state of health in South America, including Brazil.

The inhabitants of the shores of this vast continent [of South America], whether permanent or occasional, enjoy a high and a singularly uniform degree of health.

. . . Epidemic diseases are scarcely known; with widespreading and destructive force they are totally unknown. The [yellow] fever which frequently makes such havoc in the West Indies never makes its appearance here. . . . The people of this continent . . . are not free from febrile disease, but they suffer little from it; and it may be safely asserted that from severe sweeping epidemics of all kinds they are exempt. Even the malignant cholera . . . has not as yet, it is believed, touched South America.<sup>2</sup>

Another English naval physician wrote that before the introduction of yellow fever “the east coast of South America, from Pernambuco

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southward to the River Plate, was for Europeans one of the most healthy regions in the whole world, whether they resided permanently on shore, cruised in vessels along the coast, or lay at anchor in the different ports.”<sup>3</sup>

Many Brazilians shared the popular view that the intense heat of the equator somehow provided an invisible but effective barrier against the southward spread of great epidemics. Such shallow optimism was obliterated, however, by the double disaster of epidemic yellow fever in 1849-1850 and Asiatic cholera in 1855-1856. Once present in Brazil, these two diseases together claimed upward of a quarter of a million lives over a period of 50 years.<sup>4</sup> Nor was this all. In the last third of the 19th century smallpox—present since the 16th century—suddenly flared up, the toll from malaria steadily increased, beri-beri was commonly reported after the 1870s, and bubonic plague struck Santos in 1899. In just half a century Brazil's reputation had moved full circle.

In the present paper it will not be possible to examine carefully the history of all these diseases, and so, after touching briefly on cholera, I shall focus in some depth on yellow fever. These were the two epidemic diseases that clearly caused the greatest public concern in Brazil, even though both tuberculosis and infant mortality accounted for a greater loss of life. In 1892 the editor of *The Rio News* wrote that “the bare thought of an epidemic of cholera, or [yellow] fever, seems to set a community wild, and to drive out every particle of commonsense and humanity that it ever possessed. . . .”<sup>5</sup>

Let us turn first to cholera. This disease took a larger toll of human life in Brazil than yellow fever, even though it appeared later and was brought under control earlier. The extraordinary epidemic of 1855-1856 caused more deaths in Brazil than have been officially attributed to yellow fever in all years combined. Dr. Estevao Calvacanti Albuquerque, citing official government documents (*relatórios*), reported 130,940 deaths from Asiatic cholera in all of Brazil during 1855-1856; most of these occurred in the northeastern provinces.<sup>6</sup> In later years, however, a report prepared by members of the faculty of Medicine of Rio de Janeiro indicated that “the epidemic of 1855-1856 caused a mortality of more than 160,000 persons. . . .”<sup>7</sup> It seems likely that the larger figure is more accurate, since reports from remote rural areas often took several years to assemble.

The massive outbreak of cholera had been predicted by Dr. Fran-

cisco de Paula Cândido, who discovered several cases of the disease in 1854 among sailors arriving from European ports. The first case definitely known to have originated in Brazil was reported from the city of Belém on May 26, 1855. Dr. Cândido wrote that the epidemic attacked mainly persons from the lower classes, such as "soldiers, sailors, and slaves."<sup>8</sup>

By June 21 the cholera had spread to the city of Salvador, capital of the province of Bahia. Dr. Albuquerque wrote that the crisis that ensued was perhaps the worst the city had ever encountered.

The idea spread of contagion and inevitable death, the most sacred laws were violated, the city was left without physicians, the authorities abandoned their posts; relatives and friends abandoned the unfortunate patients who died unattended; hundreds of cadavers rotted unburied inside houses; consternation was general; emigration became tumultuous, all was confusion, all was horror.

[Furthermore, in the neighboring town of Santo Amaro] . . . The authorities fled, the doctors followed them; the son abandoned the father, the father the son, the daughter the mother, the husband the wife; thus the most sacred and human obligations were forgotten.<sup>9</sup>

By mid-July cholera had appeared in the city of Rio de Janeiro, where the official response was better organized than it had been in the more primitive Northeast. Medical posts and infirmaries were organized in all parts of the city and no charge was made to the indigent for either medicine or hospitalization. Dr. Albuquerque wrote that "the public charity was without limits; even the aristocracy showed itself charitable!!" Even so, nearly 5,000 persons died of cholera in the imperial capital alone from July 1855 to April 1856.<sup>10</sup>

Physicians were at a loss to know what to prescribe, since the true nature of the disease was unknown and it was, of course, a new malady for Brazil. Dr. Pio Aducci complained that nothing seemed to work with cholera. "In the cure of this disease, the calefacients do not always bring warmth, the refrigerants do not cool . . . the anti-spasmodics do not calm, the stimulants do not excite, and the counter-stimulants do not abate."<sup>11</sup> Dr. Domingos Rodrigues Seixas wrote that "tobacco has been recommended as effective in the cure of cholera. . . . It is always without any harmful effect for the system."<sup>12</sup> He also urged the use of

purgatives but condemned the practice, widespread at the time, of employing leeches. Dr. Manoel Ladislão Aranha Dantas, for example, prescribed the application of "fifteen bloodsucking leeches to the anus"<sup>13</sup> of one patient whose life unfortunately was not spared even by this heroic measure. In the realm of preventive medicine Dr. Seixas offered the almost standard advice that one should avoid milk, butter, fish of any kind, acidic fruits, and cold drinks, and added a special caution that "one should not undertake excessive intellectual labors."<sup>14</sup>

The greatest economic consequence of the great cholera epidemic of 1855-1856 was the loss of thousands of agricultural workers, particularly slaves. Dom Pedro II reported in his "Speech from the Throne" in 1856 that "our agriculture has suffered a considerable loss of laborers, and successively it becomes even more urgent [for] the acquisition of [European] colonists who are industrious and of good morals."<sup>15</sup> Had it not been for cholera 1855 would have been one of the most prosperous years ever experienced by the Brazilian economy.

Never again was there a cholera outbreak in Brazil as serious as that first great epidemic, although important outbreaks occurred between 1867 and 1870—especially among troops fighting in the Paraguayan War,<sup>16</sup>—in 1887 in Mato Grosso,<sup>17</sup> and in 1894-1895 in the Paraíba Valley and in Minas Gerais.<sup>18</sup> The threat of cholera was seldom absent during the second half of the 19th century.

At this point we turn our attention to yellow fever. The first recorded outbreak of this disease in Brazil occurred in the province of Pernambuco in the Northeast between 1685 and 1694.<sup>19</sup> For reasons unknown, the disease then seemingly disappeared in Brazil until the city of Salvador was attacked in the fall of 1849. Some 3,000 deaths were reported in Salvador<sup>20</sup> and within a year the fever had radiated to most of the larger urban centers along the coast; Recife, Natal, and Belém in the north, and Santos and Rio de Janeiro in the south were all attacked.

Since yellow fever had never been reported previously in Salvador, it was widely assumed that the disease had been accidentally imported from abroad. The lack of any certain evidence on this point did not prevent elements of the local press from singling out the American brig *Brazil* as the offending party. This ship had arrived in Salvador on September 30, 1849, after earlier stops at New Orleans and Havana—cities in which yellow fever had long been reported. Two crew mem-

bers had died of the disease en route, and others died shortly after their arrival in Brazil. Once underway, the epidemic spread rapidly among the ships in the harbor, throughout the city, and for some 20 leagues along the beach, where "it decimated a large part of the inhabitants of the province."<sup>21</sup> One doctor estimated that 80,000 persons suffered an attack in Salvador,<sup>22</sup> and another estimated 3,000 actually died from yellow fever in that city.<sup>23</sup> One victim was the American consul in Salvador, Thomas Torner.<sup>24</sup>

Many persons refused to believe that at long last yellow fever had returned to Brazil. The Minister of Empire, the Viscount of Monte Alegre, in a series of well publicized pronouncements insisted that the invading malady was malaria (*sezão*). But the diagnosis of yellow fever was confirmed by Dr. John L. Paterson (1820-1882), the Scotch physician to the British colony in Salvador. Dr. Paterson, Dr. Otto Wucherer (1820-1873), a German, and Dr. José Francisco da Silva Lima (1826-1910), a Portuguese—the most distinguished trio of medical researchers in 19th century Brazil—all of whom agreed on the diagnosis) were criticized as being "meddlesome foreigners."<sup>25</sup> Dr. José Maria de Noronha Feital later reported a similar reluctance in Rio de Janeiro to face the fact of a yellow fever epidemic. For making such a statement before the Imperial Academy of Medicine he was called a "terrorist" by one of his colleagues. Feital said, "The disease was already with us, and neither the physicians nor the authorities wanted to believe it. The fear of telling the truth was such that nobody wished that I utter the words—yellow fever!"<sup>26</sup>

In Rio de Janeiro the first confirmed case of yellow fever was that of a sailor from the military steamship *Dom Pedro II*, who was admitted to the maritime hospital of Santa Isabel on December 29, 1849.<sup>27</sup> The first confirmed case on shore came on January 7, 1850. Initially the fever spread slowly among seamen in their lodgings on shore. As late as February there were very few cases among the general population, although the fever raged epidemically aboard foreign ships in port. The *London Medical Gazette* reported that several ships lost their entire complement of officers and men.<sup>28</sup> (Some of these ships carried passengers who were bound for the gold fields of California, many of whom had no doubt chosen the long and dangerous passage around Cape Horn by way of Brazil in order to avoid the still more dangerous yellow fever zone in the isthmus of Central America and Panama.)

Observers were puzzled by the shipboard cases since on occasion no communication with land had taken place and most ships remained 40 to 50 yards offshore. In the middle of March there was a sudden spurt in which "nearly all of the population of the city found itself affected."<sup>29</sup> To coordinate the fight against the epidemic, a Central Commission for Public Health was named that included some of the nation's most distinguished physicians, including Cândido Borges Monteiro, José Pereira Rego (1816-1892), later Baron of Lavradio, Roberto Jorge Haddock Lobo, and José Francisco Xavier Sigaud (1796-1856), the French physician and author of the classic study *Du climat et des maladies du Brésil*. Neighborhood commissions were organized under supervision of members of the central commission.<sup>30</sup>

Perhaps never before had the city of Rio de Janeiro faced such a grave emergency with so little understanding of the real nature of the problem it faced. Nothing was known about the true cause or mode of transmission of yellow fever, although there were theories aplenty. Treatment of the disease was ineffective if not harmful. Physicians disagreed vehemently as to whether the disease was contagious or not but, in the absence of any certainty on this point, there was reluctance to admit yellow fever patients to the city's regular hospitals, such as the Santa Casa de Misericórdia, Brazil's oldest and best-known medical institution. Consequently, temporary infirmaries had to be established throughout the city or on islands in the bay. No charge was made to the indigent for treatment in these centers but care was minimal at best.<sup>31</sup> For example, the Sisters of Charity, the nursing order that staffed the Santa Casa in 1850, did not provide a single nurse for the yellow fever infirmaries.<sup>32</sup> On occasion sufferers from the disease were removed forcibly to such treatment centers; the police announced a plan of daily inspection of hotels and public houses in an effort to halt the spread of the disease. Another precaution, only indifferently enforced, was a ban on the re-use of funeral accessories, such as coffins, pillows, and drapes.<sup>33</sup>

The members of at least three colonies of foreigners in Rio de Janeiro—the Portuguese, the British, and the French—all sponsored beneficent societies that maintained their own modest hospitals.<sup>34</sup> Still another center of treatment was the Hospital da Veneravel Ordem Terceira de São Francisco da Penitencia, a permanent though private institution that aided many yellow fever victims. During this and later epi-

demics the Emperor dipped into his personal funds for sizable contributions on behalf of the sick poor.<sup>35</sup>

In large part because of the yellow fever epidemic of 1850, the new medical doctrine of homeopathy won wide public acceptance in Brazil. The homeopaths employed a variety of drugs and minerals, but always in minute doses and with minimal interference with the body's natural processes. To a homeopath "to open the vein in yellow fever is the same as opening the grave for the patient;" they also denounced the use of purges, sudorifics, and massive doses of drugs. The poor in particular favored homeopathy for financial reasons; one could be his own doctor by merely consulting a handbook and buying inexpensive drugs in one of the homeopathic drugstores.

The medical regulars, the allopaths, were uncompromising in their condemnation of "the new barbarians of the medical class," all of whom were denounced as charlatans. Dr. João Francisco Barreiros wrote in 1850:

There is no place for charlatans like Rio de Janeiro! Expelled, and ridiculed in Europe they come to Brazil, as a safe haven, where charlatanism governs and progresses. In this case it is homeopathy . . . [which has been adopted] by an immense number of individuals who lack any other means of support, and so they take advantage of this. Horse-shoers, tailors, and cobblers drop the horseshoe, scissors and awl and start prescribing globules!!! The *vita brevis, ars longa* Hippocrates is for them a phrase without meaning.<sup>36</sup>

It soon became apparent that the victims of yellow fever did not by any means comprise a cross-section of the general population. Mortality was highest among foreigners, including immigrants, travelers, and seamen, especially those who had come from extratropical or temperate climates. Native-born Brazilians were less affected, and many writers commented on the apparent great resistance of blacks to the disease. With regard to certain of the Europeans, Dr. J. O. McWilliam wrote:

The mortality among the newly arrived Portuguese was . . . very remarkable. In the literal sense of the word, whole families were swept off by this fever. Next to the Portuguese the Italians suffered the most. Of the company composing the Italian opera, seventeen died; as did also nearly every member of an equestrian company. For a long time not a single image-vender, rag mer-

chant, or umbrella-seller (who are almost without exception Italians) was to be seen in the streets of Rio. In many instances, half the passengers who arrived by vessels from Havre de Grace, nay, sometimes even three-fourths of them, died within three weeks after their arrival.<sup>37</sup>

As for the blacks, numerous physicians agreed with Dr. Manoel de Valladão Pimentel that the number of Negroes in the mortality statistics had been "notably low."<sup>38</sup> Dr. John Wilson Croker Pennell said that he had attended 100 blacks without losing one to the fever. In 1850, according to Dr. Pennell, two thirds of the residents of Rio de Janeiro were either blacks or mulattos.<sup>39</sup>

In figures released at the close of the epidemic the Brazilian government listed 4,160 deaths from yellow fever in Rio in 1850.<sup>40</sup> This figure is certainly too low, but how far short of the mark it may be cannot be determined. Many deaths from yellow fever were attributed to other causes, such as American typhus, bilious fever, or hemorrhagic fever. However, the mortality figures published separately by the two English physicians, Drs. Pennell and J. O. McWilliam, seem to go to the other extreme. Pennell wrote that the official figure was known to be "short of the reality, which was estimated at 13,000 by the most moderate,"<sup>41</sup> while McWilliam wrote "it is probable that in Rio [de] Janeiro alone not less than 14,000 or 15,000 persons perished."<sup>42</sup>

The government of Brazil admitted that upward of 100,000 persons had been attacked by the fever in Rio,<sup>43</sup> but the Emperor, Pedro II, in his "Speech from the Throne" of May 1850, deliberately underplayed the entire tragic episode. Never using the frightful words "yellow fever," Pedro matter-of-factly reported that "some cities of our coast . . . have been ravaged in recent months by an epidemic fever. The ravages of the sickness are not in proportion to the terror which it has caused."<sup>44</sup> The terror caused during the next half century could not so easily be ignored, as Pedro himself would have ample opportunity to observe. During 12 of the years between 1852 and 1896 more than 1,500 persons died of yellow fever in Rio de Janeiro and more than 4,000 died there in 1891, 1892, and 1894—the latter being the worst epidemic of the disease ever experienced in one year.<sup>45</sup> Brazil's reputation as a hotbed of tropical pestilence was assured. In fact, as early as October 1853 an Italian medical journal commented that yellow fever "is always found in Brazil."<sup>46</sup>



During the more than 50 years of yellow fever epidemics the effect of the disease on immigration and trade was a lively and important question. Some authorities professed to see no permanent harmful effect. Dr. J. I. Gornet wrote in his thesis of 1853:

The presence of yellow fever in the cities of America does not cause as much harm as might be thought to the development of commerce and to the various industries. The avid businessman, the bold entrepreneur who takes leave of his country, reckons many times with the probabilities of death, but these become probabilities of fortune for those who have the good luck to escape the danger.<sup>47</sup>

As the years passed and the epidemics continued to come, Brazilians characteristically voiced opinions similar to that of Dr. Fernando Costa Ferraz, who in 1880 wrote that because of yellow fever

Commerce and industry . . . suffer incalculable damages. Agriculture, counting on the benefits of a torrent of immigration, everyday sees its only rich hope evaporating; through a trick of fate it is condemned to be mongrelized! The fertility of the soil of the empire, the prodigious richness which even the bowels of the earth can't hold back, the variety of climate, all is forgotten before the terror which the yellow fever causes the foreigner.<sup>48</sup>

Many arguments were used in Brazil to convince critics, particularly potential immigrants, that the dangers had been exaggerated or that Rio de Janeiro was hardly unique in its problem of recurring epidemics. Europeans were reminded that both Paris and Brussels, for example, suffered from persistent outbreaks of smallpox and typhoid fever.<sup>49</sup> The journal, *A Imigração*, in an article responding to "various inaccuracies about Brazil," claimed that in Italy in 1886 at least 100,000 persons suffered from pellagra, and that the health of the working class of Europe was in very sad condition. "And the journalists keep screaming about yellow fever!"<sup>50</sup> Nor were the Argentines forgotten. After the *Buenos Aires Standard* editorialized "Better stand before a volley from the volunteers at Palermo than venture to Santos, Rio, or indeed any Brazilian port,"<sup>51</sup> *The Rio News* countered: "But what about Buenos Aires herself, neighbor? Would it not be well to tell Europe how much of influenza, diphtheria, typhoid fever, etc. you are having at home, so that they [sic] may know that by jumping out of the Brazilian frying

pan they are getting into the Argentine fire?"<sup>52</sup> Argentina was Brazil's leading South American rival for immigrants.

Dr. João Vicente Torres Homem (1837-1887), the man who is still regarded as Brazil's greatest physician of the Empire period, conceded in 1865 in an essay on climate, that "disease and death are often the consequences of emigration," but that sensible persons who observed certain safeguards could greatly minimize their risk. Torres Homem recommended that before settling in a tropical land such as Brazil all immigrants should first spend several months in some intermediate climatic zone. In making the voyage, the slow-moving sailing vessels were to be preferred to the new-fangled steamers because these tended to reduce the shock to the system caused by a sudden confrontation with tropical heat. Once in Brazil, the new immigrant must be careful to avoid contact with swamps, "night airs," and the direct rays of the sun. One can imagine the intense frustration even sensible persons would have experienced in trying to comply with orders such as these. This may have been the reason why Dr. Torres Homem also recommended a stiff shot of brandy every day at noon. If the brandy did not protect your system against yellow fever at least it made you feel better while waiting to find out if you were going to contract the disease.<sup>53</sup>

Despite efforts made to explain away the epidemics or to reassure immigrants that the risk was not substantial, criticism of Brazil seemed to increase rather than diminish. In 1887 *The Rio News* told potential immigrants that:

Frankly speaking the empire of Brazil is nothing less than a huge pest-house where smallpox, yellow fever, beri-beri, and various other contagious diseases are constantly in existence. . . . Somehow neither the government nor the people ever learn to take precautions against such plagues. They wait until the enemy has them by the throat and then they beg for mercy.<sup>54</sup>

The Italian physician, Dr. Fillippo Rho, stated in 1886 that the annual death rate in Rio de Janeiro had reached 40.4% and that were it not for the constant flow of immigrants, thousands of them Italians, Rio would suffer a net annual decrease in population.<sup>55</sup> *The Gazeta Medica Italiana-Lombardia* published a notice in 1876 which asserted that one fourth of all victims of the epidemic of 1876 in Rio had been Italians.<sup>56</sup> These figures cannot be confirmed, but there is no doubt

about the terrible fate of the Italian crew of the cruiser *Lombardia*. This warship arrived in Guanabara Bay on November 27, 1895, ostensibly on a "good will" mission but actually to back up a large number of Italian financial and diplomatic claims against Brazil. The *Lombardia* arrived with a crew of 249 officers and men, of whom only nine failed to contract the disease; 134 died, including the captain and the ship's physician.<sup>57</sup>

On several occasions the Italian government officially advised its citizens not to go to Brazil, and on at least one occasion the German government did the same. Joaquim da Silva Rocha, author of a history of colonization in Brazil, wrote that the Italians' restrictions adopted in 1889 "caused a considerable decrease in immigration. . . . It suffices to cite the figures for 1888 which reached 133,253 immigrants, while in 1889 it did not exceed 65,246."<sup>58</sup> Communities in Brazil free of the disease naturally used this as a selling point to attract workers. The Companhia Agrícola e Industrial, in a "notice to immigrants" published in 1890, advertised the virtues of the town of Paratí: "So close to the city of Rio de Janeiro and with communication there almost daily, [and yet] the yellow fever and other epidemics never penetrate there!"<sup>59</sup>

Dr. Nuno de Andrade (1851-1922), one of Brazil's best known and most influential doctors, made no effort to minimize the harmful effect of persistent epidemics on the rate of immigration.

What must be done in order to attract large scale immigration? . . . It is not necessary to reform or modify any institution or create any new laws. These, of course, are very important, but the principal [need] is to combat natural influences because the true cause which impeded immigration is the yellow fever.<sup>60</sup>

Dr. Francisco Simoes Correa feared that if the epidemics were not controlled Brazil would be afflicted with "coolie and African" immigrants, who in the doctor's opinion were "not suitable" for Brazil.<sup>61</sup>

It is impossible to determine how many persons made private decisions to stay out of Brazil because of yellow fever. It is clear that Brazilian officials widely assumed a causal link between the epidemics and the flow of immigrants, although many other factors such as hard times, warfare in Europe, and the existence of slavery in Brazil until 1888, would certainly have affected the rate of immigration. There is no doubt, however, that Brazil's two chief rivals for European immi-

grants—Argentina and Uruguay—exploited the epidemics to their own advantage.<sup>62</sup> And the Portuguese went right on raising the specter of disease in Brazil long after the outbreaks of yellow fever had ended. As late as 1913—10 years after the last major yellow fever epidemic in Rio de Janeiro—the Lisbon newspaper, *A Capital*, warned Portuguese to keep clear of Brazil. “The land which the emigrant imagines to be a paradise, is in reality a great cemetery, many times of his body, and still more often of his dreams. . . . It is virtually certain that he will be going to a slaughterhouse.”<sup>63</sup> Naturally the Brazilian consul in Lisbon denied this outrageous charge; he wondered in print if the Argentines were not really the ones behind it.

In an effort to protect new arrivals from yellow fever, Brazilian government, in cooperation with the various colonization companies that recruited laborers in Europe, began in 1873 to intern immigrants in special camps safely located on high ground beyond the range of the disease. This was one of the most effective measures ever adopted against yellow fever in the 19th century. Of the first 2,068 persons who were moved into the immigrant camps, only one person died of yellow fever.<sup>64</sup> A report in 1875 mentioned that as many as 5,717 were interned at a camp near Vassouras, with some 1,400 persons there at one time.<sup>65</sup> Still the foreigners accounted for most of the deaths. In the epidemic of 1891 in Rio native-born Brazilians accounted for only 249, or 5%, of the 4,454 deaths.<sup>66</sup> It appears that the process of internation ended sometime before 1890.

Between 1889 and 1892 the National Academy of Medicine, the Brazilian Society of Hygiene, and *The Rio News* all advocated that there be imposed a “total” ban of immigration for several years to the ports of Rio and Santos, the two endemic centers of the disease in Brazil.<sup>67</sup> Dr. André Rebouças, the famous engineer and one of Brazil’s most distinguished black citizens in the period of the empire, urged still more drastic actions. He compared Rio and Santos to the mythical Augean Stables and urged their abandonment as being unfit for human habitation. “It seems, then, it would be good sense to create new seaports, constructed from the beginning under hygienic conditions, on high and dry ground, perfectly drained . . . with plentiful potable water, with wide streets, avenues and boulevards, and with abundant *squares* or tree-lined plazas.”<sup>68</sup>

The serious suggestion of such drastic measures by responsible en-

gineers seems more understandable in light of the enormous economic cost of recurrent epidemics of yellow fever. The following quotation from *The Rio News* of 1889—admittedly quite long—provides an excellent summary of the over-all economic impact of the epidemics.

It is a frequent cause of complaint that foreigners should entertain so unfavorable opinions of Brazil, but who is to be blamed? The coast cities are never entirely free from sporadic cases of yellow fever. . . . And as for small-pox, the country is never free from its devastations. . . . If the actual cost in money could be computed there is not a Brazilian who would credit the figures. The large sums spent by the general and provincial governments every year in medical commissions, medicines, and other forms of official relief, are in reality only a small part of the actual cost. Add to these the money expended by private individuals in combatting the disease, the expenses of the refugees, the enhanced cost of food, the destruction of infected clothing, bedding and other property, the losses to merchants, manufacturers, and all the professions and industries which form a part of any well-organized community, and also the wages of laboring people thrown out of employment by the stagnation or suspension of all business, and the aggregate will be something appalling. To this, also, should be added the check to immigration caused by these terrible epidemics of fever and smallpox. . . . In this one respect alone Brazil has suffered immeasurably more than it would have cost to maintain the best sanitary measures in existence.<sup>69</sup>

Not only was European immigration undermined by fears of yellow fever but internal migration was also adversely affected. Dr. J. M. da Silva Coutinho, author of a work on epidemics in the Amazon Valley, said that despite the marvel of steam navigation on the Amazon River the valley had not developed as expected because of the universal conviction of its unhealthfulness. A colonization project planned for the valley in 1857 by the Brazilian government had fallen through after a senator said: "The rivers of Pará are so unhealthful that not even animals can survive along their banks." Silva Coutinho said the basis for such unjust criticism was the general belief that yellow fever prevailed epidemically throughout the valley. He was correct in his disclaimer that it was malaria and not yellow fever which then, as now, was the chief

danger to residents of the Amazon Valley, but he was perhaps guilty of chauvinistic exaggeration when he went on to claim that the healthfulness of the valley was "in no way inferior to the most favored places on the globe."<sup>70</sup>

Many immigrants who came to Brazil lived for a time in the slum neighborhoods of the big cities, and one such locality in Rio was said to be "for the most part, if not completely . . . inhabited by Spanish and Portuguese of the lowest level."<sup>71</sup> Italians were also very numerous in such communities, as were native-born Brazilians both black and white. A writer in 1896 said that these neighborhoods were "all crowded with men, women, and children of all races and colors pigged together worse than animals."<sup>72</sup> Today we might call such a neighborhood a *favela*; in the 19th century the terms *cortiço* and *estalagem* were commonly used. To many persons of the favored classes the proper name for such a place was simply anathema. One of the many reasons why *cortiços* were held in such dread was the popular view that somehow they served as breeding grounds for epidemics of yellow fever. In 1886, for example, Jorge Mirândola, Jr., was authorized by the Emperor to construct units of low-cost or "proletarian" housing. The Emperor was assured that low-cost housing as an alternative to the *cortiços* would be an excellent means of fighting "one of the real causes of the current epidemic of yellow fever."<sup>73</sup>

The Emperor was further advised by the editor of *The Rio News* that he need only investigate the living conditions of the poor to see "how it is that epidemics are always breaking out and are so difficult to suppress." Most residents of the *cortiços* suffered from an inadequate and monotonous diet, scanty clothing, and irregular employment at best. Most of "these people are huddled together in the smallest and foulest of quarters, living in huts without flooring, and sleeping on mats—sometimes ten to twenty in one small, badly ventilated room."<sup>74</sup>

There was, of course, no certain evidence linking the state of poverty with susceptibility to yellow fever; on the contrary many writers commented on the "aristocratic habits" of the disease since it favored whites over blacks and foreigners over natives. Still, some influential physicians such as Dr. Ataliba de Gomensoro, a member of the prestigious Imperial Academy of Medicine, insisted that the *cortiços* must be eradicated as a public health measure and he included yellow fever as a part of his justification. In answer to his own rhetorical question

raised on the floor of the academy, "What must be done about the *cortiços*?" Dr. Gomensoro advised immediate and stern police action. "One must disperse the residents of the infected neighborhoods. . . . [One must] enter in those dirty shacks . . . where dozens of individuals live in air sufficient for only six or eight, and disseminate them, scatter them, and make them breathe unpolluted air." To which Dr. Costa Ferraz replied: "The laws of hygiene are not legislated only for those blessed with good fortune who are able in their own good pleasure to enjoy the delights of our suburbs." It was time, he said, that the government of Brazil stopped acting on the principle that "wisdom exists only at the apex of the social pyramid."<sup>75</sup>

Once a person was unfortunate enough to contract yellow fever he quickly discovered that standards of treatment were as uncertain and controversial as any other aspect of this terrible disease. Every doctor had his own favorite remedies. According to Dr. Sebastiao Barroso, "once a proposition had been advanced, once a diagnosis offered, it had to be sustained come what may."<sup>76</sup> Medical rivalries extended into the community at large as partisans defended their favorite doctors and cures in the pharmacies, social gatherings, street corners, and the press. Nineteenth century Brazilian newspapers and medical journals were filled with the kind of contentious scholarship that Barroso described as "10 per cent substance and 90 per cent insults."<sup>76</sup>

In the realm of therapeutics there was much disagreement regarding the real value of bleedings or quinine in treating yellow fever. (Surprisingly, a few physicians still bled yellow fever patients as recently as the first years of the 20th century.) As for the efficacy of quinine in treating yellow fever, the great Dr. Torres Homem continued to prescribe massive doses of the drug until the time of his death in 1887. The editor of *The Rio News* wrote in 1880 that any person who would learn how to treat yellow fever should

call upon or communicate with some of the medical geniuses of Rio. Every one has a theory of his own, and a course of treatment different from every one else's, and a patient has only to choose the way he wishes to be cured. We have among many others the following processes: electricity, creosote, cold water, hot water, no water, fumigation, spiritualism, liver pad, and Radway's Ready Relief.<sup>77</sup>

Fortunately for the patient who required hospitalization, the dura-

tion of the sickness in yellow fever was brief. Death, if it occurred, usually came on the fourth to sixth day of the illness, and even in convalescence patients rarely needed to be confined longer than 12 days. Following the precedents established in the epidemic of 1850, yellow fever patients continued to be treated in special isolation hospitals or temporary infirmaries. The oldest and largest isolation hospital was the Maritime Hospital of Santa Isabel, located across the bay from Rio in the city of Niterói. This institution was condemned by doctors, patients, crewmen, and passengers alike in a nearly unanimous chorus. Dr. Antonio Augusto de Azevedo Sodré (1864-1929) wrote of Santa Isabel in 1887: "Abandon hope all who enter here,"<sup>78</sup> and Dr. José Lourenço reported in 1890 that conditions there were so bad that patients avoided it "like the devil fleeing from the cross."<sup>79</sup> Mortality figures at the hospital for the period 1882 to 1889 indicate a death rate of 40%.<sup>80</sup>

The temporary infirmaries which opened shop during the epidemics often reported still higher mortality figures. Dr. José Costa Velho, director of the infirmary of Visitação, reported in 1876 the death of 200 of the 412 patients treated there for yellow fever. "As a man this makes me very sad, but as a physician it does not alarm me,"<sup>81</sup> he said. Dr. Costa Velho explained that 75 persons had been admitted moribund. In what must be the worst annual record ever reported by any Brazilian hospital, the infirmary of Nossa Senhora de Saúde (Our Lady of Health), in the one-year period from July 1, 1875 to June 30, 1876, lost 603 of 788 yellow fever patients, and for good measure 133 of 196 smallpox patients—several persons who were recovering from yellow fever died of the smallpox which they contracted at Our Lady of Health.<sup>82</sup>

At this point it seems appropriate to describe briefly the burial practices used in Rio de Janeiro. From 1850 to 1890 burial was a monopoly of the *Empresa Funeraria*, an adjunct of the Santa Casa de Misericórdia. The Santa Casa was sometimes referred to as "a state within a state," and although this hospital ostensibly was purely a charitable institution, critics charged that its funeral monopoly was one of the most lucrative businesses in town.<sup>83</sup> Some of the profits, however, were used to equip and maintain two infirmaries for yellow fever patients during times of epidemics, of which Our Lady of Health was one.<sup>84</sup> But still the *Empresa Funeraria* was accused of charging exorbitant prices and cutting corners through the improper reuse of funeral equipment. The Rev-



erend A. S. Hawkesworth, an English minister, wrote that "hospital victims and the poor are not buried in any coffin at all; these are used again and again, while the well-to-do were sent off to the cemetery in style in a funeral *bond*," a plain, open car somewhat like a hearse. Reverend Hawkesworth further related that "the Brazilian coffin is totally different from our Anglo-Saxon one, being made of thin 'match boarding,' . . . the whole [device] covered with tinsel and gaudy cloth; it is at best a 'ramshackly' affair, and resembles nothing so much as a showcase for samples."<sup>85</sup>

The popular dread of yellow fever made it possible for a time to broach in public the sensitive question of cremation, a practice inalterably opposed by the Roman Catholic Church, the established church of Imperial Brazil. Dr. Azevedo Sodré wrote in 1888 that "anyone who speaks about cremation will receive in exchange an excommunication from the lords of the land."<sup>86</sup> This statement seems exaggerated, since in his thesis in 1883 Dr. Carlos Loudares said that some Brazilian soldiers who had died of cholera during the Paraguayan War had been cremated.<sup>87</sup> However, there was still little or no public discussion of cremation until in 1880 a chemist and physician in Rio, Dr. Domingos Freire, made the astonishing claim that he had discovered the specific causative microbe of yellow fever and, further, that these microbes were capable of living indefinitely in the soil of cemeteries where yellow fever victims had been buried. Dr. Freire argued that cremation was the only means of destroying these microbes and he founded a cremation society in Rio de Janeiro.<sup>88</sup> I have found no record of the cremation of yellow fever victims in Brazil, although it was done occasionally in Argentina.<sup>89</sup>

Dr. Freire himself seemed to have lost interest in the matter, since he spent more and more time in his laboratory. In 1887 he announced that he had discovered the specific causative microbe of cancer.<sup>90</sup> His scientific researches were so thorough that almost never did he cite the writings of any other investigator. Freire produced a lengthy bibliography of pseudo-scientific works, written in bad French. Historically, he is chiefly remembered as the first person in any country to attempt to apply microbiological techniques to the study of yellow fever. This is not unimportant. Freire's researches, however overblown and faulty, at least had the merit of moving Brazilian scientific studies into the shadow of the laboratory—removing them from the weird

realm of miasmas, "night airs," and effluvia. Perhaps it was just as well that Freire died in 1899; he did not live to see the last remnants of his scientific pretensions destroyed by the Walter Reed commission in Havana in 1900 when it scientifically confirmed the theory of the Cuban physician, Dr. Carlos Juan Finlay (1833-1915), that yellow fever was transmitted through the bite of infected *Aedes aegypti* mosquitos.

In Brazil the findings of the Reed commission were not immediately accepted by all, but one man who never doubted their validity was a young physician, Dr. Osvaldo Gonçalves Cruz (1872-1917),<sup>91</sup> who was the first of his countrymen to study at the Pasteur Institute in Paris. Although only 29 years of age and not well known in his own country, Cruz was appointed Director General of Public Health for Brazil on March 31, 1903. He told the President of Brazil, Francisco Rodrigues Alves, that "the mosquito theory is an accomplished fact, an idea victorious,"<sup>92</sup> and that yellow fever could be eradicated from Rio de Janeiro in three years if the techniques worked out by the Americans in Cuba were applied faithfully in Brazil.

Dr. Cruz said that instead of trying to eliminate the disease through quarantine, which had never worked, one should concentrate on two key points: 1) isolation of yellow fever patients from mosquitoes and 2) eradication of the mosquitoes. These suggestions were implemented as quickly as possible and the campaign was a brilliant success. All but the most prejudiced critics were persuaded. By 1904, after the first real test of the new methods, deaths from yellow fever in Rio de Janeiro were reduced to only 48. Cruz wrote in that year, "never again will we fear epidemics of yellow fever."<sup>93</sup> One of the great milestones in Brazilian history had been passed.

Dr. Joao Baptista Lacerda cogently summed up what this great accomplishment meant to Brazil and Brazilians:

In no other country of the world have the experiments of Cuba had such a great repercussion as in Brazil. We were exhausted, without courage, and without the will to continue the campaign against yellow fever. In this we employed all the resources which science made available to us; we exhausted our forces in bitter combat against the wrathful disease, and we were always conquered. Abroad we were accused of weakness and ineptness, and the foreigners fled terror-stricken from these

cursed shores, repeating a black legend of horrors and mortalities that stained the reputation of our country and affronted the honor of its governors. We were already half resigned to an unchangeable fatalism when on the horizon there shone the light of hope coming in intermittent waves from the shores of Cuba.<sup>94</sup>

These brief comments cannot possibly do justice to the great achievements and reputation of Dr. Osvaldo Cruz. He is best known for his fight against yellow fever, but he performed numerous services to science and his country during a short but brilliant career. In 1899 he helped a team of physicians curtail an invasion of bubonic plague in Brazil, although this brought him no great fame. Later he waged a militant although only partly successful campaign against smallpox. He remained as Director General of Public Health until 1909, at which time he resigned to devote full time to the activities of the Instituto Osvaldo Cruz, which was then Brazil's leading medical research center. He continued at this post until his death in 1917 from Bright's disease at the age of 44. He was young in years but bowed down with praise and honors from both the New World and the Old. He had used the enormous prestige he had derived from his victory over yellow fever in Rio de Janeiro to upgrade medical and scientific research and teaching throughout Brazil. Cruz is generally regarded as the greatest figure in the field of public-health administration ever produced in Latin America.

Yellow fever was not eliminated completely in Brazil during the time of Cruz. Foci of the disease remained in such cities as Salvador, Belém, Manaus, Victoria, and even Niterói for varying periods of time. *Aedes aegypti* was completely eradicated in Brazil by 1942 through efforts coordinated by the Rockefeller Foundation, but it has recently been reimported to Belém from the United States, where it has long been common.<sup>95</sup> Unfortunately, the brilliance of Cruz's achievement was such that many Brazilians hastily concluded that most of their health problems had been solved. Nothing could have been further from the truth. Brazilians seemed so dazzled by this one great achievement that less publicized but even more deadly diseases such as tuberculosis, malaria, Chagas' Disease, hookworm, and that old foe smallpox were edged out of public consciousness. Men such as Cruz, Belisário Pena (1868-1939), Emilio Ribas (1862-1925), and Arthur Neiva

(1880-1943) were certainly not blinded by one great victory; they knew that Brazil could not rest on her laurels, but the momentum was not maintained. For example, in the vast interior regions of Brazil, such as the dry *sertão* of the Northeast and the Far West and the trackless green jungles of Amazonia, areas far removed from the crowded coastal cities, hardly a beginning had been made in the realm of public health. In 1918, a year after Cruz's death, Dr. Azevedo Sodré wrote that the *saneamento* (a general uplifting of standards of health) of the vast rural interior region was Brazil's single most urgent problem.<sup>96</sup> In that same year Dr. Miguel Pereira made his famous remark—considered unpatriotic by many Brazilians—that “Brazil is an immense hospital.”<sup>97</sup> Pereira in effect chided Brazil for somehow confusing Rio de Janeiro and the coastal zones with the entire country. Important as it was, the victory over yellow fever was only a single battle won in the ever-widening fight against epidemic and endemic diseases. According to Azevedo Sodré, 80% of the rural population of the state of Rio de Janeiro was infested with hookworms, a disease which had aroused virtually no public concern even though, according to Azevedo Sodré, the economic loss from hookworm was twice that which had resulted from 50 years of yellow fever.<sup>98</sup> Cruz had made a great beginning but so much remained to be done.

In conclusion, what was the chief significance of the yellow fever epidemics in Brazil? Most tragic of all was the great loss of human life. The majority of the more than 100,000 persons who died of yellow fever were young adults from Europe, whose services as artisans, laborers, and entrepreneurs were in great demand in a developing country such as Brazil. An American consul in Rio estimated in 1898 that 85% of all the victims had been foreigners.<sup>99</sup> Although precise statistics are not available on this point, it seems certain that thousands of potential immigrants were deterred from settling in Brazil because of the general fear of yellow fever. Most who did settle there decided to locate in the relatively fever-free southern regions, such as the highlands of Sao Paulo, Paraná, and Rio Grande do Sul.

The epidemics of yellow fever were the chief cause of Brazil's dreadful reputation throughout the world as a hothouse of tropical pestilence. It is important to learn, as we have seen in this paper, that this reputation did not derive from the essential tropical condition of the country, about which little could be done, but from an historical

situation that could be and was in fact controlled. Similarly, the conquest of diseases such as cholera and yellow fever, along with improved understanding of other so-called tropical diseases, helped to show that "many of the alleged deficiencies of residents of tropical lands, such as lack of energy, vitality, and 'ambition,' ought to be attributed more to the causative effect of disease rather than to inherent racial or climatic factors."<sup>100</sup> After the victory of Osvaldo Cruz, nationalists began to talk less about the dangers of life in the tropics and more of its blessings. José Maria Bello has written that because of Cruz's conquest of yellow fever "all of Brazil seemed to take on new life, with greater confidence and pride in herself."<sup>101</sup>

As we look back over the story of the epidemics of yellow fever and cholera in Brazil we see once again that students of history can gain useful insights and even inspiration from a careful study of the annals of the past; yet each succeeding generation must go forth to fight new battles and win new victories in the ancient struggle between mankind and disease.

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